SIEMENS

MOBILETT Plus/Plus E/Plus M

SP

Service

Repair Instruction

Replacement of the inverter and belonging software

© Siemens AB 2000
The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

English
Print No.: SPR8-215.091.04.02.02
Doc. Gen. Date: 08.00
Replaces: SPR8-215.091.04.01.02.
65 68 674

Chapter	Page	Revision
All	All	02

Page

1 Prerequisites 1 - 1

General . . . 1 - 1
Training of customer support engineers . . . 1 - 1
Document required . . . 1 - 1
Components included . . . 1 - 1
Tools required . . . 1 - 1
Time required . . . 1 - 1
Safety information . . . 1 - 1

2 Exchanging the Inverter and belonging Firmware 2 - 1

Exchange inverter and PROMs . . . 2 - 1
Work routine . . . 2 - 1

3 Supplement to Functional Description 3 - 1

Exposure preparation . . . 3 - 1
Rotating anode starter . . . 3 - 1

4 Supplement to Maintenance Instructions 4 - 1

Maintenance test . . . 4 - 1

5 Supplement to Service Instructions 5 - 1

List of test programs available in service mode . . . 5 - 1
P02 - Rotation test . . . 5 - 1

6 Supplement to Wiring Diagram 6 - 1

Anode rotation . . . 150

7 Appendix 7 - 1

P08 . . . 7 - 1
P16 . . . 7 - 1

8 Changes to previous version 8 - 1

This page intentionally left blank.

General

The inverter D13 with part no. 60 77 270 is no longer available. It was replaced by 65 28 314. When replacing the old type with the new one, the existing Firmware has to be replaced by V1.5 (part no. 65 71 645) for MOBILETT Plus/Plus M and by V1.5E (part no. 65 71 504) for MOBILETT Plus E.

Training of customer support engineers

Due to the technology used in this equipment, setup, service and maintenance should be performed only by customer support engineers who have work authorization for MOBILETT Plus.

Document required

Service Instructions for MOBILETT Plus/Plus E/Plus M.

Components included

Article	Quantity	Part no.
Firmware kit: V1.5	1	65 71 645
Firmware kit: V1.5E	1	65 71 504
Inverter	1	65 28 314
Repair Instruction (this instruction)	1	65 68 674

Tools required

Standard tool kit.

Time required

Installation of inverter and Firmware: approximately 1 hour for 1 person.

Safety information

Read all safety notes in the document Service Instructions and pay special attention to the notes below.

⚠WARNING

Never work with the system open if the capacitor is charging or has just charged.

The capacitor bank may still be charged even if the system is switched OFF and the line voltage cable is disconnected. Life-threatening electric shock hazard exists.

The capacitor bank must be considered charged until the protective measures listed in the document Service Instructions have been performed.

CAUTION

Be sure to follow the ESD guidelines.

This page intentionally left blank.

Exchange inverter and PROMs

When exchanging the "old" inverter with part no. 60 77 270 with 65 28 314, it is also necessary to exchange the present Firmware.

There are different Firmware for MOBILETT Plus/Plus M and MOBILETT Plus E. Exchange PROMs in position I72, I66 and I74 with the following:

MOBILETT	Firmware kit	Part no.
MOBILETT Plus/Plus M	V1.5	65 71 645
MOBILETT Plus E	V1.5E	65 71 504

Work routine

1. Mains voltage OFF.
2. Discharge capacitor bank. The procedure is described in the document Service Instructions.
3. Mains voltage ON.
4. Set position 1 on switch S1, found on board D1, in position ON (service mode).
5. Run the service programs P08 (Display the message history), and P16 (Show the exposure counter). The procedure is described in the document Service Instructions. The information in these programs will be lost after the exchange of PROMs is done. Write down the information in the attached tables in chapter "Appendix" on Page 7 - 1 and file it under register 10 in the Technical Manual.
6. Mains voltage OFF.
7. Exchange the inverter located on the right-hand side.
8. The PROMs in position I72, I66 and I74 are found on board D1 under the top cover. Select a Firmware kit depending on the MOBILETT model, see the table above. Replace each PROM with a new PROM marked with the same letters.
9. Mains voltage ON.
10. Run the adaptation program P10. The procedure is described in the document Service Instructions. The program is done when PASS is shown on the display, approximately 20 minutes.
11. Set position 1 on S1 in position OFF.
12. Mains voltage OFF.
13. Remount the top, front and side covers.
14. Check the function by making one exposure.
15. In the chapters "Operation" (sub chapter "Exposure release switch") and "Display messages" (sub chapter "USE xx: Important message") in the **Instructions for Use**, check the maximum preparation time. If it is 10 seconds change it to 20 seconds, sign and write the date on the side. Inform the customer of the change if applicable.
16. Insert the supplements for each technical document attached in this document into the Technical Manual for the Mobilett Plus product affected.

This page intentionally left blank.

Exposure preparation

The primary contact in the exposure-release switch is first closed. This initiates the following functions:

1. switches off the preheating,
2. switches on the exposure heating,
3. starts the two second rotating-anode acceleration,
4. if the anode frequency after acceleration is >147 Hz, the buzzer on board D3
5. generates three beep tones, and
6. the green ”ready” LED on the control panel is turned on.

Rotating anode starter

To get the rotating anode up to speed a control signal with a frequency of 160 Hz is applied to the two test points "ROT A" and "ROT B" on board D4.

The run-up-time requires two seconds. After this the control signal is switched off and the anode runs freely. If the anode looses speed and a frequency <147 Hz is measured, the anode is accelerated for 0,75 s. These additional "pushes" are repeated, if necessary, until the limit of the preparation time (20 s) or until the release of an exposure. A push is interrupted if an exposure signal is made.

The anode is up to speed if the pulse frequency "ROT" is > 147 Hz after the run-up-time of 2 s.

If the frequency detected is below 147 Hz the entire run-up procedure will be repeated and the reached speed will be measured again.

If the second try indicates that the required speed of 147 Hz is now exceeded, the control system generates the internal message "anode up to speed"! This completes the preparation together with exposure heating on.
The green "ready" LED on the control-panel turns on and the buzzer generates three beep tones.

The magnetization in the stator and rotor winding produces an eddy current field which slows down the speed of the rotor. The brake time to a full stop takes 9 s.

This page intentionally left blank.

The service program P05 is removed. This affects the maintenance test as shown below:

Maintenance test

Use these service programs to check the display, filament heating, rotating anode and capacitors.

While the test is running, observe the display. If an error is determined during the course of the test, the program is interrupted and the associated error is displayed, accompanied by an audible signal.

Additional information about each test is located in the section "List of test programs in Service Mode" in the service instructions. The test sequences are also described in this section.

- Start the programs by activating the "Light localizer lamp."

PMF Display test

PMF Filament test

PMF Rotating anode test

PMF Capacitor bank and charge test

P04 Display test. Check whether the display and the LED's light up and whether the buzzer sounds. The test will automatically be repeated once.

P01 Filament test. When the test is successfully completed, the following message will appear for 4 seconds:

FIL PASS = The filament test was successfully completed.

P02 Rotating anode test. During this test, rotating anode start-up is checked and the rotation frequency is displayed. The following message appears when the test is successfully completed:

rot PASS = The rotating anode test was successfully completed.

P03 Capacitor bank and charge test. During the test, the actual voltage in the capacitor bank is displayed.
The following message appears when the test is successfully completed:

CAP PASS = The capacitor bank and charge test was successfully completed.

If an error is determined during any of the tests, the current program stops and the following message appears:

Err xx = Test results are "not valid."

This page intentionally left blank.

- Max preparation time is increased from 10 s to 20 s.
- The service programs P05 (Automatic maintenance test), P12 (Inverter and single tank test) and P13 (Inverter test) are removed.
- **Only for MOBILETT Plus HP** - The service program P11 (Backup battery test) is removed.

List of test programs available in service mode

P02 - Rotation test

(Wiring diagram X037E, page 150)
Accelerates the anode with a 160 Hz control signal during two seconds. After this first acceleration, the speed is measured and if necessary, a second acceleration of two seconds is performed. When the correct speed is reached, the anode will rotate freely for 20 seconds or until the rotation frequency is below 142 Hz before it is braked during 9 seconds to a stop. An error message will be displayed after two unsuccessful attempts to accelerate the anode or if the anode looses speed too fast. When the test is activated, the display shows:

kV mAs

Rot tESt = Rotation test

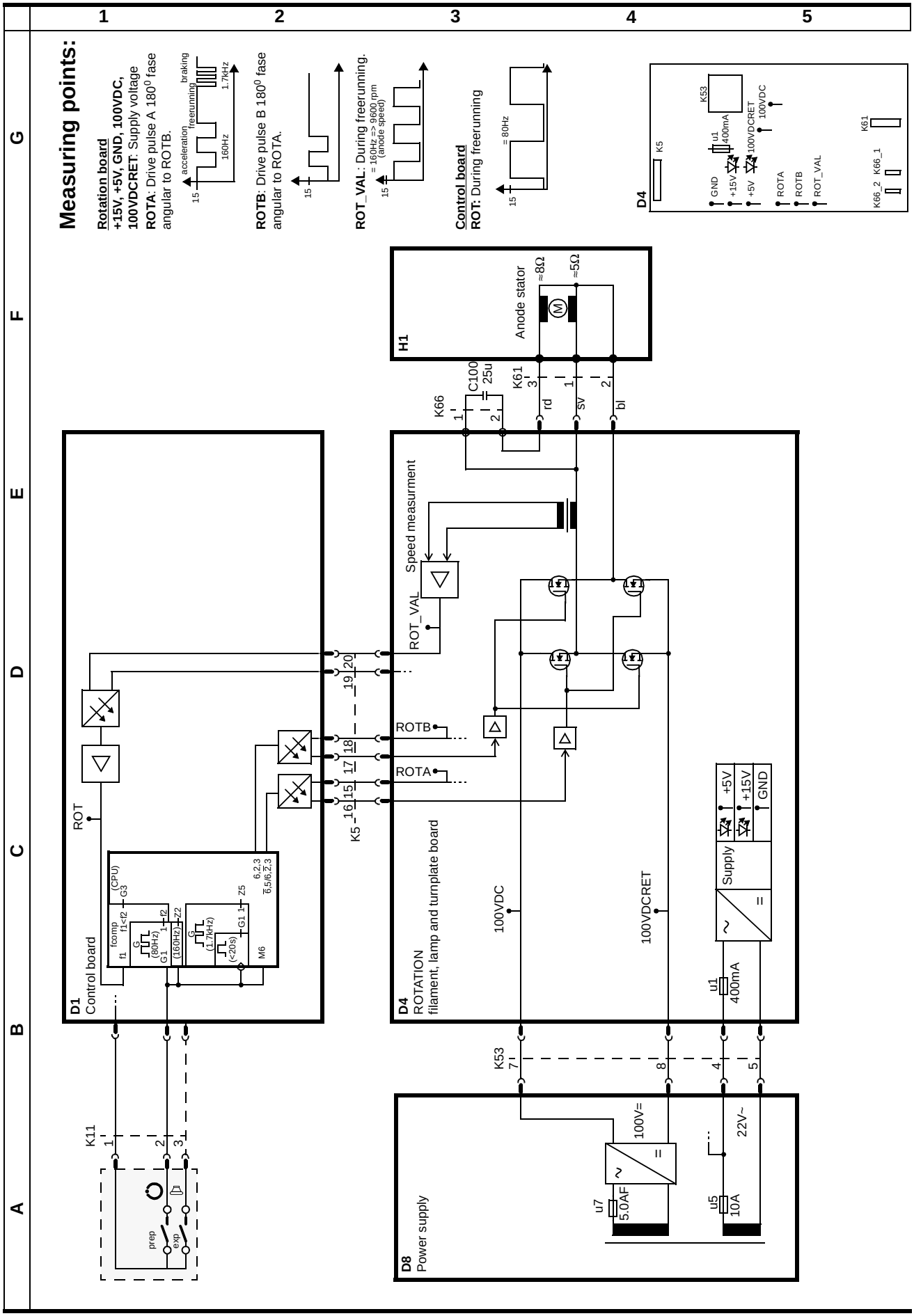
After acceleration, the display shows the actual rotation frequency:

kV mAs

Rot 143 = Rotation frequency 143 Hz: Normal value 158 Hz. Min. value 142 Hz.

This page intentionally left blank.

Anode rotation



X037E

	1	2	3	4	5
G					
F					
E					
D					
C					
B					
A					

P08

Appearance number	Message history

P16

Total amount of exposures.....

This page intentionally left blank.

Chapter	Page	Change
0	All	Chapter completely revised.
1	1	New software version with new article number implemented. Field service engineers -> Customer support engineers. Article number of this document is changed.
2	1	New software version with new article number implemented.
3	All	New chapter
4	All	New chapter
5	All	New chapter
6	All	New chapter
7	All	New chapter

This page intentionally left blank.